3.3.1.6 Lake Superior

3.3.1.6.1 Community Overview

Lake Superior is a unique and vast resource of fresh water covering 31,700 square miles. It is the largest freshwater lake in the world by surface area and has 156 miles of coastline in Wisconsin. The lake is primarily cold water with summer maximum water temperatures below 22 degrees Celsius. Lake Superior is relatively infertile with a historic fish fauna that consisted primarily of lake trout, ciscoes/whitefishes (Salmonidae), and sculpins (Cottidae). Warmer and more fertile harbors and bays (e.g., Chequamegon) had a more diverse assemblage of cool and warmwater fishes, especially in the family Percidae. Now the biota is dominated by introduced or invasive non-native species. Due to extirpations in other lakes, Lake Superior supports the last remaining Great Lakes population of two whitefish relatives - kiyi and shortjaw cisco.

Lake Superior has not experienced the same levels of development, urbanization and pollution as the other Great Lakes. Although Lake Superior is the cleanest and most healthy of all the Great Lakes, it is still threatened by toxic pollutants that bioaccumulate in the food chain and persist in the environment. These substances can be transported long distances in the atmosphere and end up in the lake. Local sources contribute pollutants to air and water, adding to the pollutant load entering Lake Superior. Because of its long retention time (191 years), pollutants entering Lake Superior can remain in the lake for over a century before draining to the lower Great Lakes.

3.3.1.6.2 Vertebrate Species of Greatest Conservation Need Associated with Lake Superior

Eight vertebrate Species of Greatest Conservation Need were identified as moderately or significantly associated with Lake Superior (Table 3-60).

Table 3-60. Vertebrate Species of Greatest Conservation Need that are (or historically were) moderately or significantly associated with Lake Superior.

Species Significantly Associated with Lake Superior
Birds
Horned Grebe
Caspian Tern
Common Tern
Fish
Lake Sturgeon
Herptiles
Mudpuppy
Species Moderately Associated with Lake Superior
Birds
Bald Eagle
Fish
Kiyi
Shortjaw Cisco

In order to provide a framework for decision-makers to set priorities for conservation actions, the species identified in Table 3-60 were subject to further analysis. The additional analysis identified the best opportunities, by Ecological Landscape, for protection, restoration, and/or management of both Lake

Superior and associated vertebrate Species of Greatest Conservation Need. The steps of this analysis were:

- Each species was examined relative to its probability of occurrence in each of the 16 Ecological Landscapes in Wisconsin. This information was then cross-referenced with the opportunity for protection, restoration, and/or management of Lake Superior in each of the Ecological Landscapes (Tables 3-61 and 3-62).

- Using the analysis described above, a species was further selected if it had both a significant association with Lake Superior and a high probability of occurring in an Ecological Landscape(s) that represents a major opportunity for protection, restoration and/or management of Lake Superior. These species are shown in Figure 3-6.

Table 3-61. Vertebrate Species of Greatest Conservation Need that are (or historically were) *significantly* associated with Lake Superior and their association with Ecological Landscapes that support Lake Superior.

Lake Superior	Birds (3)*			Fish (1)	Herptiles (1)
Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type	Horned Grebe	Caspian Tern	Common Tern	Lake Sturgeon	Mudpuppy
MAJOR					
Superior Coastal Plain					
PRESENT (MINOR)					
North Central Forest					

*** The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.**

Color Key

= HIGH probability the species occurs in this Ecological Landscape

= MODERATE probability the species occurs in this Ecological Landscape

= LOW or NO probability the species occurs in this Ecological Landscape

Table 3-62. Vertebrate Species of Greatest Conservation Need that are (or historically were) *moderately* associated with Lake Superior and their association with Ecological Landscapes that support Lake Superior.

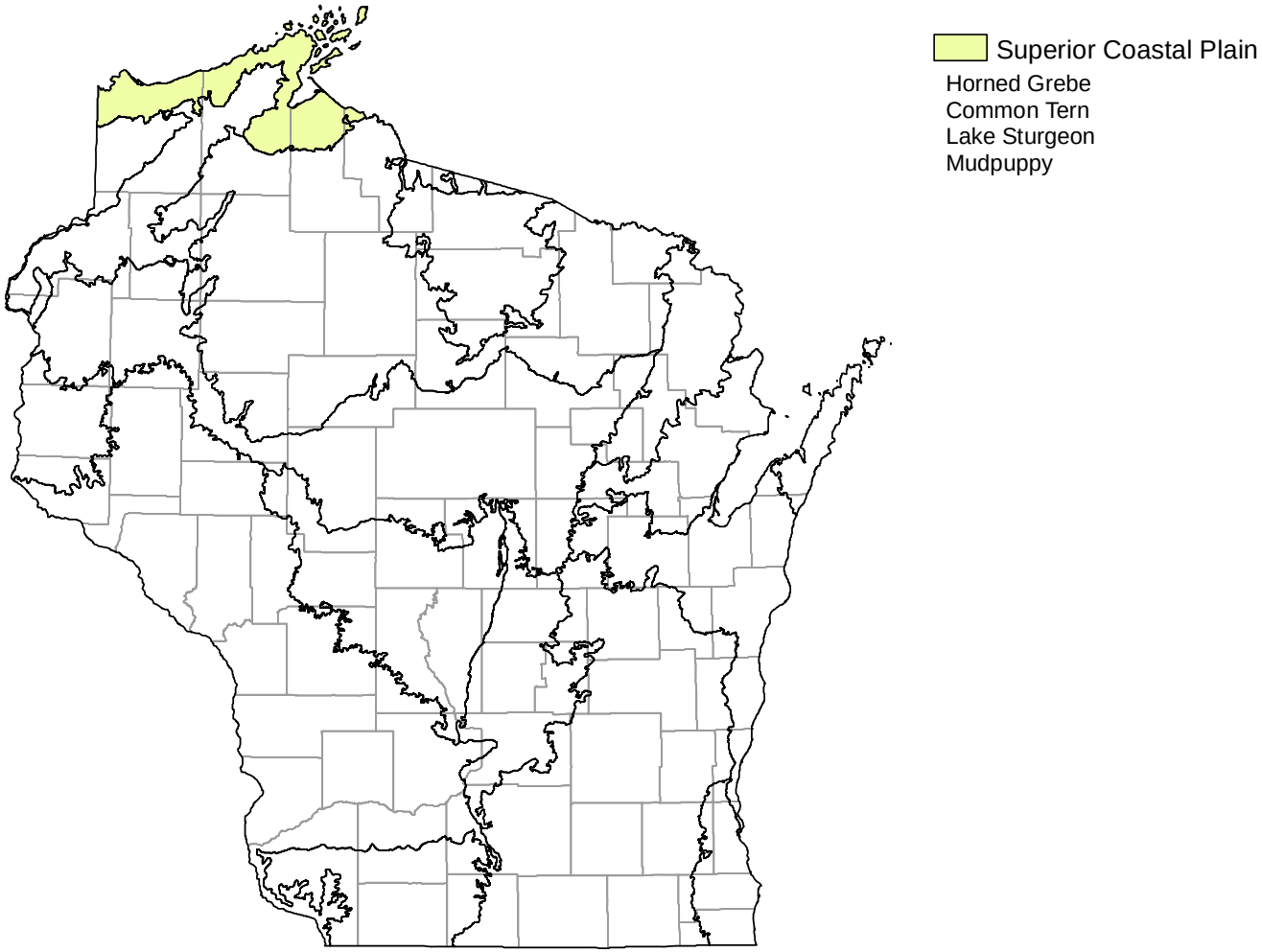
Lake Superior	Birds (1)*	Fish (2)	
Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type	Bald Eagle	Kiyi	Shortjaw Cisco
MAJOR			
Superior Coastal Plain			
PRESENT (MINOR)			
North Central Forest			

*** The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.**

Color Key

- = **HIGH probability the species occurs in this Ecological Landscape**
- = **MODERATE probability the species occurs in this Ecological Landscape**
- = **LOW or NO probability the species occurs in this Ecological Landscape**

Figure 3-6. Vertebrate Species of Greatest Conservation Need that have ***both* a significant association with Lake Superior ***and*** a high probability of occurring in an Ecological Landscape(s) that represents a major opportunity for protection, restoration and/or management of Lake Superior.**



3.3.1.6.3 Threats and Priority Conservation Actions for Lake Superior

The following list of threats and priority conservation actions were identified for Lake Superior. The threats and priority conservation actions described below apply to all of the Ecological Landscapes in Tables 3-61 and 3-62 unless otherwise indicated.

Threats and Issues

- Exotic aquatic plant and animal species alter aquatic habitats, food webs and species interactions.
- Development and urbanization of harbors and river mouths is causing degradation and loss of wetland and aquatic habitats.
- Contamination from industrial micro-contaminants (e.g., polychlorinated biphenyls or PCB's) are making fish unsafe to eat.
- Dams on tributaries block fish migration.
- Non-point source pollution resulting from urbanization and poor watershed land-use practices is degrading nearshore and tributary habitat and water quality.
- Overfishing (now largely controlled and regulated) historically depressed some populations.

Priority Conservation Actions

- Various treaties, institutions, and citizen groups exist to help manage biodiversity in Lake Superior, and these resources should be called upon to assist with management for Species of Greatest Conservation Need.
- Improve regulations and education to prevent the introduction of additional exotic invasive aquatic species and the slow the spread of existing invasive species.
- Protect and restore harbor and river mouth habitats.
- Work to reduce or eliminate and remediate sources of micro-contaminants.
- Remove dams or install effective fish passages at dams.
- Improve watershed land-use practices to reduce non-point source pollution.
- Continue state involvement in federal and regional programs to minimize long-distance atmospheric transport of toxic and/or harmful substances.
- Continue application of effective fisheries management to ensure that commercial and recreational fisheries are maintained at sustainable levels.